

04-668

MEMORANDUM OF UNDERSTANDING

AMONG

THE MINISTER OF NATIONAL DEFENCE OF CANADA

THE MINISTER OF DEFENCE OF THE FRENCH REPUBLIC

THE FEDERAL MINISTRY OF DEFENCE OF THE FEDERAL REPUBLIC OF GERMANY

THE MINISTER OF DEFENCE OF THE ITALIAN REPUBLIC

THE MINISTER OF DEFENCE OF THE KINGDOM OF THE NETHERLANDS

THE SECRETARY OF STATE FOR DEFENCE OF
THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND

AND

THE SECRETARY OF DEFENSE ON BEHALF OF
THE DEPARTMENT OF DEFENSE OF THE UNITED STATES OF AMERICA

CONCERNING

THE MISSION TRAINING VIA DISTRIBUTED SIMULATION (MTDS) PROJECT
(SHORT TITLE 'MTDS MOU')

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INTRODUCTION

The Department of National Defence of Canada, the Minister of Defence of the French Republic, the Federal Ministry of Defence of the Federal Republic of Germany, the Minister of Defence of the Italian Republic, the Minister of Defence of the Kingdom of the Netherlands, the Secretary of State for Defence of the United Kingdom of Great Britain and Northern Ireland, and the Secretary of Defense on behalf of the Department of Defense of the United States of America, hereinafter referred to as the "Participants":

Having a common interest in defence and in the conduct of effective air operations;

Having regard to the provisions of the Agreement between the Parties to the North Atlantic Treaty regarding the Status of their Forces (NATO SOFA) dated 19th June 1951;

Recognizing the work on MTDS performed under the NATO Research and Technology Organisation (RTO);

Recognizing the benefits to be obtained from cooperation in the application of emerging distributed simulation technology and the need for standardization and interoperability of air mission training through distributed simulation;

Desiring to improve their mutual air operations training capability through the application of emerging computing, communication and simulation technologies;

Seeking to enhance collaboration among the Participants in the exploitation of distributed simulation for multi-national air mission training;

Recognising the limited opportunities for coalition live flying training exercises due to cost, consumption of airframe life, lack of airspace, environmental and operational constraints;

Desiring to demonstrate the potential of modern simulation technology to provide a distributed training environment for complex air operations; and

Desiring to foster current cooperative activities on air MTDS which offers the potential for conducting cost-effective mission training and preparing combat-ready NATO aircrew for operational conditions;

have reached the following understandings:

SECTION I - DEFINITIONS AND ABBREVIATIONS

Background Information	Information not generated in the performance of this MTDS MOU.
CGF	Computer Generated Force(s): Computer-generated representations of vehicles, humans and other Forces entities that interact with each other in real time in a systematic way in a synthetic (virtual) environment.
Classified Information and Material	Official information and material that requires protection in the interests of national security and is so designated by the application of a security classification marking. This information may be in oral, visual, magnetic, optical or documentary form or in the form of equipment or technology.
COMAO	Composite Air Operation: An "operation interrelated and/or limited in both time-scale and space, where units differing in type and/or role are put under the control of a single commander to achieve a common, specific objective". In this context, some typical roles are: Strike Attack, Air Defence, Offensive Support and Reconnaissance. Support roles include Airborne Early Warning, Electronic Warfare and Air-Air Refuelling.
Contractor	Any entity undertaking work under a contract or equivalent arrangement with a Participant for the performance of work under this MOU. This term includes subcontractors.
Controlled Unclassified Information	Unclassified information to which access or distribution limitations have been applied in accordance with applicable national laws or regulations. Whether the information is provided or generated under this MOU, the information will be marked to identify its "in confidence" nature. It could include information that has been declassified, but remains controlled.
Defence Purposes	Any use in any part of the world by or for the armed forces of any Participant.
DIS	Distributed Interactive Simulation: Message protocol wherein data packets are sent and shared across a network of distributed simulations in accordance with international standards for interoperability
Distributed Simulation	The linking together of live, virtual or constructive simulations/simulators via a computer network to provide a common synthetic battle space.

DSA/NSA	Designated or National Security Authority: The security office approved by national authorities to be responsible for the security aspects of this MOU.
EW	Electronic Warfare
Federation	Multiple simulation systems (federates) that jointly represent a virtual world and share information via a DIS/HLA interface.
Foreground Information	Information generated in the performance of this MTDS MOU.
HLA	High Level Architecture: Infrastructure that provides the rules and standards necessary to support interoperability in a distributed simulation.
Information	Any information, regardless of form or type, including that of a scientific or technical nature, and also including photographs, interim and final reports, manuals, threat data, experimental data, test, designs, specifications, processes, techniques, inventions, drawings, software including source code, technical writings, sound recordings, pictorial representations, and other graphical presentations, whether in magnetic tape, computer memory, or any other form and whether or not subject to copyrights, Patents, or other legal protection.
Intellectual Property	Any intellectual product which is capable of being protected under law including inventions, patented or not, trademarks, industrial designs, copyright and technical information including software, data, technical know how, manufacturing information and know how, techniques, technical data package, manufacturing data packages and trade secrets and all other intellectual property as defined in Article 2 of the Convention Establishing the World Intellectual Property Organisation, signed in Geneva on 14 July 1967.
MTDS Project	The co-operative activity under this MOU to develop and demonstrate an interoperable, manageable, secure and realistic simulated operational environment in which front line aircrew can conduct a simulated COMAO (known as Exercise First WAVE).
Patent	Legal protection of the right to exclude others from making using, or selling an invention. The term refers to any and all Patents, as defined by national law.
PMP	(MTDS) Project Management Plan

Project Equipment

Any material, equipment and item, sub-system, component, special tooling or test equipment jointly acquired or provided for use in the MTDS Project.

Project Invention

An invention or discovery formulated or made (conceived or "first actually reduced to practice") in the course of work performed under the MTDS Project. The term first actually reduced to practice means the first demonstration, sufficient to establish to one skilled in the art to which the invention pertains, of the operability of an invention for its intended purpose and in its intended environment.

PSI

Project Security Instruction

Task Team

Working group comprising representatives from each of the Participants.

Third Party

A government other than the government of a Participant and any person or other entity whose government is not a government of a Participant.

WAVE

Warfighter Alliance in a Virtual Environment

SECTION II - OBJECTIVE

- 2.1. The objective of this MOU is to provide the means for the Participants to create and demonstrate an interoperable, manageable, secure and realistic simulated operational environment in which front line aircrew can conduct a simulated COMAO (known as Exercise First WAVE).
- 2.2. To accomplish this aim, the MTDS Project will be conducted in an environment in which aircrew training systems will be employed, together with other facilities for planning, briefing and debriefing. The MTDS Project will have both training and technical objectives. Specific aims include:
 - 2.2.1. investigate and assess the potential of MTDS to enhance aircrew mission readiness for NATO air operations, including consideration of training, simulation technology and management aspects;
 - 2.2.2. increase awareness of MTDS capabilities amongst national and NATO military staffs;
 - 2.2.3. capture experiences, distil and document lessons learned; and
 - 2.2.4. provide recommendations for the future direction of MTDS in NATO.
- 2.3. The results of these activities are intended to enhance coalition operational and technical interoperability among the Participants for air mission training.
- 2.4. The MTDS Project will address key interface and secure communications challenges imposed by the use of simulation assets provided by the Participants.

SECTION III - SCOPE

3.1. The purpose of this MOU is to define the framework of the co-operation regarding the MTDS Project, and encompasses development and demonstration of Exercise First WAVE. An MTDS PMP will be developed by the MTDS Steering Group that will provide a detailed description of the MTDS Project delivery requirements and milestones.

3.2. The scope of activities under this MOU will encompass the conduct of an aircrew training exercise using distributed simulation technologies, and will involve experienced military personnel, provided by each Participant, in the planning, execution and de-briefing of a coalition air training exercise.

3.3. The expected products and experiences resulting from the MTDS Project will include, but are not limited to, the following:

- 3.3.1. Creation of a prototype multi-national MTDS environment;
- 3.3.2. Planning and execution of a multi-national COMAO exercise to demonstrate the MTDS concept;
- 3.3.3. Establishment of the MTDS concept as a feasible approach to air mission training;
- 3.3.4. Experience in distance team working with multi-national partners;
- 3.3.5. Lessons learned in implementing a DIS/HLA federation across a Wide Area Network (WAN);
- 3.3.6. Experiences in connecting multi-site simulation assets;
- 3.3.7. Experience in addressing multi-national security issues in MTDS operations;
- 3.3.8. Experience in exercising management of a multi-national, multi-site distributed simulation;
- 3.3.9. Development of relevant MTDS performance metrics; and
- 3.3.10. Reports and recommendations for future MTDS activities.

3.4. The MTDS Project under this MOU will cover the following activities:

- 3.4.1. Develop the architecture for MTDS;
- 3.4.2. Test network connectivity and system integration;
- 3.4.3. Conduct the MTDS Project demonstration; and
- 3.4.4. Evaluate results and feasibility for future MTDS.

SECTION IV - MANAGEMENT

4.1. Management of the MTDS Project will be undertaken by a Steering Group. The Steering Group will be comprised of a single representative appointed by each of the Participants. Each member of the Steering Group will have one vote. The Steering Group will be chaired by a chairman selected by the members of the Steering Group. All decisions of the Steering Group will be made unanimously.

4.2. The Steering Group will be supported by several Task Teams and the MTDS Project Manager. Meetings of the Steering Group will be held quarterly, or as appropriate.

4.3. The Steering Group will be responsible for:

4.3.1. Exercising executive level oversight of the Task Teams, including planning, direction and overall management of the MTDS Project;

4.3.2. Approving the PMP;;

4.3.3. Reviewing the technical progress of the MTDS Project against the PMP;

4.3.4. Resolving issues brought forth by the Task Teams;

4.3.5. Recommending to the Participants amendments to this MOU;

4.3.6. Reviewing the progress reports submitted by the Task Teams;

4.3.7. Maintaining oversight of the security aspects of the Project including ensuring the development and approval from the appropriate DSA/NSA of the PSI prior to the transfer of Classified, or Controlled Unclassified Information (in accordance with Sections IX (Controlled Unclassified Information) and XIII (Security)); and

4.3.8. Overall risk management of the MTDS Project.

4.4. Task Team membership will consist of a chairman together with appropriate representatives of each Participant. Task Team chairmen will be appointed by the Steering Group. The Task Team may invite relevant specialists to participate on an ad hoc basis. Task Teams will meet at a frequency and location decided by each team. Recommendations of the Task Teams will be achieved by consensus. Any disputes will be referred by the Task Team chairman to the Steering Group for resolution.

4.5. Task Teams will, at the direction of the MTDS Steering Group, conduct the work to be performed under the MTDS Project. All Participants will be involved in each Task Team. A short description of each Task Team's objectives is set out below:

4.5.1. Operations & Training Task Team: This team will determine the training objectives and the components required to conduct the MTDS Project as a demonstration of the training potential of MTDS. It will determine the battle scenario to be used, based on real-world

experiences in a European setting. This team will provide a User Requirements Document (URD) that defines the requirements for the distributed simulation to be developed, integrated, utilised and assessed during the MTDS Project. This includes the Force mix of manned and CGF components, types of weapon systems, intelligence picture, the rules of engagement, etc. This Team will provide exercise management and work closely with the Technical Task Team in developing the distributed simulation.

4.5.2. Technical Task Team: This task team will establish the technical requirements for the MTDS Project. This includes establishing the sites, assets to be employed and estimates of the associated costs. This task team will define a test plan and integrate and test the federation to be used. This task team will also determine the network connections between sites, and address routing and interoperability issues.

4.5.3. Security Task Team: This task team will be responsible for identifying and implementing the security processes that will allow the MTDS Project to take place. This team will identify the type of encryption device to be used, and also address issues regarding the release of classified information, such as weapon parameters, avionics and sensor performance, flight performance envelopes, and EW capability. The team will document the broader security issues that Participants will face in establishing MTDS. This team will provide the PSI.

4.5.4. Assessment Task Team: This task team will document operational training strengths and weaknesses of the MTDS Project for training in simulated air operations; assess the potential benefits of MTDS for such training; and identify overarching assessment issues. This team will develop suitable metrics to assess such topics as aircrew performance, team skills, the potential of MTDS as a training tool, CGF performance, and the exercise management process.

4.5.5. Awareness Task Team: This team will make the relevant national and NATO military agencies and General Officers aware of the MTDS Project and its objectives. The team will cover two broad areas: (1) preparing and presenting briefings to NATO and national interests on the importance of MTDS as a mission training tool, and (2) identifying stakeholders who should be invited to observe the MTDS demonstration.

4.6. Each Task Team Chairman will be responsible for:

4.6.1. The day to day management of Task Team activities as defined in the PMP;

4.6.2. The coordination of efforts within the Task Team, including management of the schedule, performance, and technical aspects;

4.6.3. The coordination of efforts between the Task Teams including facilitation of exchange of project information;

4.6.4. The monitoring of Task Team progress;

4.6.5. The preparation of progress reports for submission to the Steering Group;

4.6.6. Implementing the PSI upon final DSA/NSA approval; and

4.6.7. Referring issues to the Steering Group that cannot be resolved by the Task Teams.

4.7. The Project Manager will be responsible for the day to day management of the MTDS Project. The Project Manager will report to the Task Team Chairmen and the Steering Group. Specific responsibilities will include:

4.7.1. Preparation and maintenance of the PMP;

4.7.2. Preparation and maintenance of the MTDS Master Project Schedule;

4.7.3. Progress monitoring and reporting according to the PMP;

4.7.4. Facilitation of Steering Group and Task Team meetings and Progress Reviews; and

4.7.5. Tracking of the Task Teams' conduct of work and provision of outputs/deliverables as required by the PMP.

SECTION V - SHARING OF TASKS

5.1. The sharing of tasks will be as follows:

5.1.1 All Participants will provide access to, and use of, defined simulation assets, with appropriate platform and weapon characteristics as defined in the scenario and objectives of the MTDS Project URD. Electronic simulation data which may have been provided previously under a separate arrangement between Participants may be provided to the other Participants as Background Information for the purposes of this MOU.

5.1.2 All Participants will provide network connections from their respective simulation assets to the MTDS Project WAN in accordance with the PSI.

5.1.3 All Participants will, to the maximum extent possible, provide military personnel for White Force composition in accordance with the White Force Concept of Operations provided in the MTDS Project URD.

5.1.4 The Participants will jointly share and participate, at varying levels of effort, in the following areas. Details will be provided in the MTDS Project PMP.

	CA	FR	GE	IT	NL	UK	US
Steering Group							
Define PMP	✓	✓	✓	✓	✓	✓	✓
Manage Project	✓	✓	✓	✓	✓	✓	✓
Liaise with and brief other groups	✓	✓	✓	✓	✓	✓	✓
Provide Progress Reports	✓	✓	✓	✓	✓	✓	✓
Prepare Final Report	✓	✓	✓	✓	✓	✓	✓
Training Task Team							
Develop User Requirements Document (URD)	✓	✓	✓	✓	✓	✓	✓
Develop Customer Requirements Document (CRD)	✓	✓	✓	✓	✓	✓	✓
Develop Exercise Management Plan	✓	✓	✓	✓	✓	✓	✓
Develop Implementation Plan	✓	✓	✓	✓	✓	✓	✓
Conduct Testing	✓	✓	✓	✓	✓	✓	✓
Technical Task Team							
Design MTDS Federation	✓	✓	✓	✓	✓	✓	✓
Implement MTDS Federation	✓	✓	✓	✓	✓	✓	✓
Develop Test Plan	✓	✓	✓	✓	✓	✓	✓
Conduct Testing	✓	✓	✓	✓	✓	✓	✓
Conduct MTDS Demonstration	✓	✓	✓	✓	✓	✓	✓
Security Task Team							
Define Requirements	✓	✓	✓	✓	✓	✓	✓
Develop Project Security Instruction (PSI)	✓	✓	✓	✓	✓	✓	✓
Develop Framework for Assessment	✓	✓	✓	✓	✓	✓	✓
Conduct Testing	✓	✓	✓	✓	✓	✓	✓
Assessment Task Team							
Develop Federation Validation Strategy	✓	✓	✓	✓	✓	✓	✓

	CA	FR	GE	IT	NL	UK	US
Develop Metrics	✓	✓	✓	✓	✓	✓	✓
Collect Data	✓	✓	✓	✓	✓	✓	✓
Awareness Task Team							
Briefing Preparation/presentation	✓	✓	✓	✓	✓	✓	✓
Develop Stakeholder Awareness Plan	✓	✓	✓	✓	✓	✓	✓
Develop Demonstration Plan	✓	✓	✓	✓	✓	✓	✓

5.1.5. The U.S. Department of Defense will:

5.1.5.1. Provide the MTDS Project Manager to perform Project Manager functions detailed in Section IV (Management). On completion of Exercise First WAVE, Project Manager responsibilities will be re-assigned at the discretion of the Steering Group.

5.1.5.2. Create the initial draft of the MTDS Project Customer Requirements Document (CRD).

5.1.6. The Canadian Department of National Defence will:

5.1.6.1. Provide the electronic terrain database to be used in the MTDS Project.

5.1.6.2. Provide the Test Federate to be used in the MTDS Project.

5.1.6.3. Create the initial draft of the MTDS Project PSI.

5.1.7. The U.K. Ministry of Defence will:

5.1.7.1. Create the initial draft of the MTDS Project URD.

5.1.7.2. Create the initial draft of the PMP.

5.1.7.3. Create the Air Tasking Order (ATO) to be used in the MTDS Project.

SECTION VI - CONTRACTUAL PROVISIONS

6.1. This MOU is not a procurement instrument. If any Participant determines that contracting is necessary to fulfil its responsibilities under Section III (Scope), that Participant will contract in accordance with its respective national laws, regulations and procedures.

6.2. When a Participant individually contracts to perform a task under this MOU, it will be responsible for its own Contracts and no other Participant will be subject to any cost or liability arising from such Contracts without its prior written consent.

6.3. Each Participant will negotiate to obtain the rights to use and disclose Information required by Section VIII (Disclosure and Use of Information). Each Participant will insert into its contracts (and require Contractors to insert in subcontracts) suitable provisions to satisfy the requirements of this MOU, including but not limited to Section VIII (Disclosure and Use of Information), Section IX (Controlled Unclassified Information), Section XI (Third Party Sales and Transfers), and Section XIII (Security). During such Contract process, each Participant will advise prospective Contractors of their obligation to notify that Participant immediately if they are subject to any license or agreement that will restrict the Participants' freedom to disclose Information or permit its use. Each Participant will also advise its respective Contractors to employ their best efforts not to enter into any new agreement or arrangement that will result in restrictions.

6.4. In the event a Participant is unable to secure adequate rights to use and disclose Information as required by Section VIII (Disclosure and Use of Information) or is notified by Contractors or potential Contractors of any restrictions on the Disclosure and Use of Information, that Participant will notify the other Participants of the restrictions, and if necessary, the MTDS Steering Group will promptly consult with a view towards continuation of the MTDS Project on a modified basis. Each Participant will promptly advise the other Participants, via the Project Manager, of any schedule delay or performance problems of its Contractors for consideration by the Steering Group.